



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES
(15-XZ-5881 (MHM 13043US01))

#15/Appeal
Brief

7.25.03

C. Moore

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PATENT APPLICATION OF:

Ganin

SERIAL NO.: 09/682,001

FILED: July 6, 2001

FOR: Multiple-Plane Acquisition in
Digital X-Ray Radiography

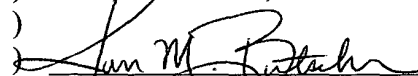
Examiner: C. Church

Group Art Unit: 2882

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) 
) Joseph M. Butscher
) Reg. No. 48,326

) Date: July 15, 2003

BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The present Applicant, Alexander Ganin, respectfully requests that the Board of
Patent Appeals and Interferences reverse the final rejection of claims 1-2, 5-7, 9-21, and
23 of the present application.

THE REAL PARTY IN INTEREST

The real party in interest is GE Medical Systems Global Technology Company, LLC, assignee of the present application, a Delaware limited liability company with principal offices at 3000 North Grandview Boulevard, Waukesha, Wisconsin 53188.

RELATED APPEALS AND INTERFERENCES

Not applicable.

STATUS OF THE CLAIMS

The present application originally included 21 claims.¹ Claims 3, 4 and 8 were cancelled without prejudice or disclaimer to the subject matter therein, while claims 22 and 23 were added during prosecution.² Claim 22 was later cancelled without prejudice or disclaimer to the subject matter therein.³ Thus, claims 1-2, 5-7, 9-21 and 23 remain pending. The text of the pending claims is provided in the Appendix.

Claims 1-9 were originally rejected under 35 U.S.C. §103 as being unpatentable over Khutoryansky et al. (United States Patent No. 5,734,694).⁴ Claims 6, 7 and 10-21 were also rejected under 35 U.S.C. §103 as being unpatentable over Khutoryansky et al. in view of either Lin et. al (United States Patent No. 6,222,902) or Kruger (United States Patent No. 4,577,222). In response to these and other rejections, the Applicant filed an Amendment on February 25, 2002, in which claims 10, 12 and 15 were amended.

¹ See US 2003/0007594, published January 9, 2003 (the published version of the specification of the present application as filed July 6, 2001) at page 7.

² Paper 6 (Amendment dated July 16, 2002) at pages 1 and 3.

³ Paper 10 (Amendment dated December 4, 2002) at page 1.

⁴ Paper 3 at page 3.

The Examiner maintained the rejection of claims 1-5, 8 and 9 under 35 U.S.C. §103 as being unpatentable over Khutoryansky et al., but rejected claims 6-7 and 10-21 as being unpatentable over Khutoryansky et al. in view of Sata (United States Patent No. 5,412,702).⁵ The Applicant responded to these and other rejections by filing an amendment on July 16, 2002, in which claims 1, 5, 6, 7, 10, 15, and 16 were amended, claims 3, 4 and 8 were canceled without prejudice or disclaimer to the subject matter therein, and claims 22 and 23 were added.⁶ The Examiner did not enter the amendments because they allegedly raised new issues that would require further consideration and/or search.⁷ Consequently, the Applicant filed a Request for Continued Examination on July 16, 2002.⁸

Despite the fact that the Examiner indicated that the amendment filed on July 16, 2002 raised new issues that required further consideration and/or search, the Examiner maintained the rejection of claims 1, 2, 5, and 9 (and also claims 22 and 23) under 35 U.S.C. §103 as being unpatentable over Khutoryansky et al.⁹ However, instead of rejecting claims 6-7 and 10-21 as being unpatentable over Khutoryansky et al. in view of Sata, as in a previous office action, these claims were rejected as being unpatentable over Khutoryansky et al. in view of Tam (United States Patent No. 5,717,732) and Sata.¹⁰

The Applicant amended claims 1 and 23 (and cancelled claim 22 without prejudice or disclaimer to the subject matter therein) to overcome the rejections.¹¹ Once

⁵ Paper 5 at page 3

⁶ Paper 6 at pages 1-3.

⁷ Paper 7.

⁸ Paper 8.

⁹ Paper 9 at page 2.

¹⁰ *Id.* at pages 2-3.

¹¹ Paper 10 at page 1-2.

again, however, claims 1, 2, 5, 9 and 23 were rejected under 35 U.S.C. §103 as being unpatentable over Khutoryansky et al. and claims 6, 7 and 10-21 were rejected as being unpatentable over Khutoryansky et al. in view of Tam and Sata.¹² In response to the Applicant's arguments, the Examiner stated the following:

Although applicant observes that Khutoryansky moves his source/detector assembly to the center position after a scan, this has no bearing whatever on patentability of the claims since they do not recite where the source/detector are placed *after a scan*, i.e., a storage position, but only that at the *beginning* of a scan they are moved to the prep position, defined by applicant on page 3 of the specification simply as the opposite ends of the scan range. Nowhere does Khutoryansky state that his scans begin at the center of the scan range as is absurdly implied by applicant.¹³

In response to the Examiner's rejections, the Applicant filed an Amendment on April 4, 2003, in which claim 1 was amended for the third time.¹⁴ In particular, the Applicant amended the claim, as per the Examiner's implicit suggestion, by adding the limitation "positioning said detector and x-ray tube at said second detector and x-ray tube preparation positions, respectively, *after* said acquiring a first x-ray image step."¹⁵ The Examiner, however, mailed an Advisory Action on May 5, 2003.¹⁶ Ironically, the Examiner stated that the "lines added to claim 1 simply repeat the step recited in the previous 2 lines," despite the fact that he also indicated that the Amendment "raised new

¹² Paper 11 at pages 2-3.

¹³ *Id.* at page 3 (emphasis in original).

¹⁴ Paper 12 (Amendment dated April 14, 2003) at page 2.

¹⁵ *Id.* (emphasis added).

¹⁶ Paper 13.

issues that would require further consideration and/or search.”¹⁷ The Examiner also indicated that a Notice of Appeal was filed on April 14, 2003, but the Applicant filed a Notice of Appeal on May 15, 2003, in response to the Advisory Action.¹⁸ Thus, claims 1, 2, 5-7, 9-21 and 23 remain pending in the present application and currently stand rejected as set forth above. The Applicant appeals the rejection of claims 1, 2, 5, 9 and 23 under 35 U.S.C. §103 as being unpatentable over Khutoryansky et al. and claims 6, 7 and 10-21 under 35 U.S.C. §103 as being unpatentable over Khutoryansky et al. in view of Tam and Sata.

STATUS OF AMENDMENTS

Subsequent to the final rejection of claims 1, 2, 5-7, 9-21, and 23 mailed February 26, 2003, the Applicant filed an Amendment on April 14, 2003, in which claim 1 was amended to include the additional limitation “positioning said detector and x-ray tube at said detector and x-ray tube preparation positions, respectively, after said acquiring a first x-ray image step.”¹⁹ The Amendment was not entered, as discussed above.²⁰

SUMMARY OF THE INVENTION

The present invention relates to multiple plane imaging in digital x-ray systems using a servo-tomo function.²¹ As shown in Figure 1, an x-ray apparatus 100 includes an x-ray tube 102 housed in an x-ray tube system 103 and an x-ray detector 112.²² During a

¹⁷ *Id.*

¹⁸ Paper 14 (Notice of Appeal mailed May 15, 2003).

¹⁹ Paper 12 at page 2.

²⁰ Paper 13.

²¹ US 2003/0007594 at [0001].

²² *Id.* at [0017].

servo-tomo technique, a motion controller 132 moves the x-ray tube 102, the x-ray tube system 103 and the x-ray detector 112 while the x-ray apparatus 100 acquires images.²³ The x-ray apparatus 100 is a digital system, as the image information is acquired, saved and displayed *without* the use of a film based or CR plate detector.²⁴

The x-ray tube 102 and the detector 112 illustrated in Figure 2 are not mechanically connected in a manner that they mirror movement of one another.²⁵ When an exposure is taken utilizing the servo-tomo function, the motion controller 132 may move the x-ray tube 102 and the detector 112 at different speeds and distances.²⁶ Additionally, the motion controller 132 may change the angle of the x-ray tube 102 relative to the detector 112 throughout the acquisition.²⁷ For example, an x-ray technician enters information into the operator interface panel 130 to set up an x-ray exposure and acquire a tomographic image utilizing the servo-tomo function.²⁸ The system controller 128 receives information from the operator interface panel 130 and utilizes the information entered to control the synchronous movement of the x-ray tube 102 and the detector 112 during the exposure.²⁹

The motion of the x-ray tube system 103 and the detector 112 is linear, and the x-ray tube system 103 and the detector 112 move in opposite directions.³⁰ For example, the x-ray tube system 103 may move towards the foot of a patient support table 204 and

²³ *Id.*

²⁴ *Id.* at [0018].

²⁵ *Id.* at [0020].

²⁶ *Id.*

²⁷ *Id.*

²⁸ *Id.*

²⁹ *Id.*

³⁰ *Id.* at [0022].

the detector 112 may move towards the head of the table 202.³¹ The motion of the x-ray tube 102 is angular, and takes the form of an angular rotation about a fulcrum point 222. The angular rotation keeps the central x-ray beam 106 directed through the fulcrum point 222.³²

An x-ray technician may enter a sweep angle θ , which is the angle over which the x-ray exposure occurs.³³ The size of the sweep angle θ determines the tomographic plane thickness, or the size of the slice.³⁴ For example, a large angle will result in a relatively thin tomographic slice, while a small angle produces a relatively thick tomographic slice.³⁵

The x-ray technician may enter patient data into the operator interface panel 130 and select an appropriate application utilizing the servo-tomo function, by which multiple tomographic images are acquired.³⁶ A system controller 128 uses the parameter entered by the x-ray technician and the speed and distance parameters calculated by the system controller 128 to calculate a prepare position 302, as shown in Figure 3, for the x-ray tube 102 and a prepare position 306 for the detector 112.³⁷ The x-ray apparatus 100 utilizes the motion controller 132 to move the x-ray tube 102, the x-ray tube system 103, and the detector 112 to an area between the prepare positions 302, 304, 306 and 308.³⁸

³¹ *Id.*

³² *Id.*

³³ *Id.*

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.* at [0043].

³⁷ *Id.* at [0045].

³⁸ *Id.*

The locations of the prepare positions 302, 304, 306, and 308 are dependent upon the capabilities of the motion controller 132 to achieve and maintain a desired speed.³⁹

During the prepare cycle, the x-ray tube 102, the x-ray tube system 103, and the detector 112 move to the first identified prepare positions.⁴⁰ For example, the x-ray tube 102 moves to the prepare position 302 identified for the first image acquisition, and the detector 112 moves to the prepare position 306 identified for the first image acquisition.⁴¹ During the first image exposure, the system controller 128 controls the simultaneous movement of the x-ray tube 102 and the detector 112 such that the x-ray tube 102 moves from the prepare position 302 in the direction of the foot of the table 204, while the detector moves from the prepare position 306 in the direction of the head of the table 202.⁴²

As the first image is being acquired, the system controller 128 calculates the deceleration profiles and the next prepare positions 304 and 308 for the x-ray tube and the detector 112 based upon the parameters entered for the next image.⁴³ Once the x-ray tube 102 and the detector 112 have completed their respective travel distances, the image acquired from the first image acquisition is displayed on a monitor 122, while the system controller directs the x-ray tube 102 to move to prepare position 304, and the detector 112 to move the prepare position 308 in order to acquire the second image.⁴⁴

³⁹ *Id.*

⁴⁰ *Id.* at [0047].

⁴¹ *Id.*

⁴² *Id.* at [0048].

⁴³ *Id.* at [0051].

⁴⁴ *Id.* at [0052].

Unlike previous methods of acquiring servo-tomo images, an acquired image may be immediately evaluated because there is no need for the image to be developed (in the case of conventional film or CR plates).⁴⁵ Further, unlike fluoroscopy, the images may be viewed on the monitor 122 as they are acquired *and* saved for future evaluation or processing in an image storage device 124.⁴⁶

Previously, only the parameters for one image were entered at a time. Once the image was acquired, a second image acquisition process would be set up. Further, the x-ray tube and detector of previous systems typically returned to their first prepare positions after an image was acquired. Embodiments of the present invention, however, utilize multiple prepare positions, thereby eliminating the need to move the x-ray tube 102 and the detector 112 to their original starting positions after an image is acquired.⁴⁷ Additionally, because the parameters for all of the tomographic images are already entered, the next exposure may quickly be initiated, thereby reducing the amount of time a patient spends on the table (and increasing patient throughput).⁴⁸

ISSUES FOR REVIEW

- I. Is the rejection of claims 1, 2, 5, 9 and 23 under 35 U.S.C. § 103 as being unpatentable over Khutoryansky et al. proper?
- II. Is the rejection of claims 6, 7 and 10-21 under 35 U.S.C. § 103 as being unpatentable over Khutoryansky et al. in view of Tam and Sata proper?

⁴⁵ *Id.* at [0053].

⁴⁶ *Id.*

⁴⁷ *Id.* at [0055].

⁴⁸ *Id.*

GROUPING OF CLAIMS

The claims stand or fall together respecting the issues on appeal.

ARGUMENT

The Examiner has maintained the rejection of claims 1, 2, 5, 9 and 23 under 35 U.S.C. § 103 as being unpatentable over Khutoryansky et al., and claims 6, 7 and 10-21 under 35 U.S.C. § 103 as being unpatentable over Khutoryansky et al. in view of Tam and Sata. These rejections are improper and should be reversed.

I. The Rejection Of Claims 1, 2, 5, 9 And 23 Under 35 U.S.C. § 103 As Being Unpatentable Over Khutoryansky et al. Is Improper

Khutoryansky et al. does not teach, nor suggest, all the limitations recited in claim 1 of the present application. In particular, Khutoryansky et al. does not teach, nor suggest, at least the following:

- acquiring digital x-ray images;
- moving said detector and x-ray tube to... second detector and x-ray tube preparation positions[, which are located at opposite ends of scan ranges], respectively; [and] positioning said detector and x-ray tube at said second detector and x-ray tube preparation positions, respectively, after said acquiring a first x-ray imaging step; and
- acquiring first and second x-ray images based on scan parameters.

A. Khutoryansky et al. Does Not Teach, Nor Suggest, “Acquiring Digital X-Ray Images,” As Recited In Claim 1

Khutoryansky et al. discloses a universal radiographic apparatus that allows an operator to select between *conventional* radiographic mode and linear tomographic mode.⁴⁹ Khutoryansky et al. states the following:

In accordance with the present invention, a universal radiographic room provides the capability to conduct *conventional* radiographic examination or linear tomographic examinations using a relatively economical and compact arrangement that incorporates many features particularly attractive to the practitioner.⁵⁰

Khutoryansky et al. discusses conventional radiography and linear tomographic examination in the Background:

The nature of conventional radiographic examination is well known.... Linear tomography, where both the X-ray tube and X-ray *film* are constrained to straight-line motion is perhaps the most common and easiest to practice variant of tomography.⁵¹

Khutoryansky et al. is directed to a universal imaging room that may image a patient using either *conventional* filmed based radiography, or film based linear tomography. That is, Khutoryansky et al. merely combines the conventional techniques of film-based, conventional radiography and film based linear tomography. However, Khutoryansky et al.

⁴⁹ Khutoryansky et al. at Abstract.

⁵⁰ *Id.* at Column 2, lines 30-34 (emphasis added). *See also Id.* at Column 1, lines 49-53.

⁵¹ *Id.* at Column 1, lines 16-29 (emphasis added).

does not disclose any form of tomography besides the film based type, as discussed above.

For example, Khutoryansky states:

These needs and others are satisfied by the universal radiographic room of the present invention, in which an x-ray generator equipped with a generator control that selects between *conventional* radiographic and linear tomographic modes operation is provided.⁵²

As discussed above, conventional radiography and linear tomography are film-based techniques. However, Khutoryansky does not teach, nor suggest, a digital detector, or digital radiography or tomography.

Khutoryansky et al. does not teach, nor suggest, a method of acquiring “*digital x-ray images*,” as recited in claim 1 of the present application. Thus, as an initial matter, Khutoryansky et al. does not teach a “method for acquiring digital x-ray images,” as recited in claim 1. The Applicant respectfully submits that Khutoryansky et al. does not render claim 1, and the claims that depend from claim 1, unpatentable. Thus, claim 1, and the claims that depend from claim 1, should be in condition for allowance.

B. Khutoryansky et al. Does Not Teach, Nor Suggest, “Moving Said Detector And X-Ray Tube To Said Second Detector And X-Ray Tube Preparation Positions,” As Recited In Claim 1

Khutoryansky et al. describes a system in which a tube and bucky return to a CENTER position *after* each individual x-ray exposure. Khutoryansky et al. does not, however, teach, nor suggest “positioning [a] detector and x-ray tube at second detector and x-ray tube preparation positions, respectively, after acquiring a first x-ray image.” In fact, Khutoryansky et al. explicitly teaches away from this limitation:

⁵² *Id.* at Column 1, lines 49-53 (emphasis added).

Khutoryansky states the following:

Once the predetermined exposure time has been reached, implying that the tube and bucky travel have reached the end of the selected sweep angle, x-ray exposure is terminated. *After each tomographic exposure, the system returns to the CENTER position.*⁵³

Therefore, Khutoryansky et al. discloses a system that *always* returns to the CENTER position after an image is acquired, but no suggestion is made in Khutoryansky et al. to move the system to a position other than CENTER after each exposure. Thus, Khutoryansky et al. does not render claim 1 obvious because it does not teach, nor suggest, “moving said detector and x-ray tube to... second detector and x-ray tube preparation positions[, which are located at opposite ends of scan ranges], respectively; [and] positioning said detector and x-ray tube at said second detector and x-ray tube preparation positions, respectively, after said acquiring a first x-ray imaging step,” as recited in claim 1 of the present application. Thus, claim 1, and the claims that depend from claim 1, should be in condition for allowance.

C. Khutoryansky et al. Does Not Teach, Nor Suggest, Acquiring First and Second X-Ray Images Based on Scan Parameters

Khutoryansky et al. also does not teach, nor suggest, the claimed identifying step in which scan parameters for more than one slice of interest are identified. In contrast, Khutoryansky et al. teaches a radiographic room capable of accepting the scan parameters for one image at a time, and then acquiring a single conventional radiographic or linear tomographic image. Khutoryansky et al. does not teach, nor

⁵³ *Id.* at Column 8, lines 7-11 (emphasis added).

suggest, storing scan parameters for more than once slice of interest. It would not have been obvious to modify Khutoryansky et al.'s system in a manner that would render the claimed invention unpatentable because Khutoryansky et al.'s system does not have the capability of storing scan parameters for successive slices of interest.

As described in columns 4-6 of Khutoryansky et al., scan parameters are entered on the universal control panel using various system switches. Only one value for reach scan parameter may be entered at one time.⁵⁴ Longitudinal LEFT and RIGHT and Rotation CW and CCW are available with the system of Khutoryansky et al., but scan parameters for these switches are neither entered, nor selected. Rather, the switches enable manual movement of the table and x-ray tube. However, scan parameters "designating slices of interest from a patient anatomy" are not stored. Khutoryansky et al. does not teach, nor suggest, "identifying scan parameters designating slices of interest from a patient anatomy," because Khutoryansky et al. is incapable of storing multiple scan parameters for multiple slices of interest. Thus, claim 1, and the claims that depend from claim 1, should be in condition for allowance.

II. The Rejection Of Claims 6, 7 And 10-21 Under 35 U.S.C. § 103 As Being Unpatentable Over Khutoryansky et al. In View Of Tam And Sata Is Improper

As discussed above, Khutoryansky et al. does not teach, nor suggest, at least the following:

- identifying scan parameters designating multiple slices of interest from a patient anatomy; and
- acquiring a series of images with a digital x-ray detector.

Additionally, Khutoryansky et al. does not teach, nor suggest,

⁵⁴ *Id.* at Column 5, lines 17-62.

- “displaying images simultaneously as each image in said series of images is acquired.”

Even assuming, arguendo, that Khutoryansky et al. could be combined with Tam and Sata as asserted by the Examiner, this combination taken as a whole does not teach, nor suggest, all of the limitations listed above.

The Applicant also notes that claims 6 and 7 depend from claim 1 and include all the limitations of claim 1. Because Khutoryansky et al. does not teach, nor suggest, all the limitations of claim 1, as discussed above, the Applicant respectfully submits that the combination of references does not render claims 6 and 7 obvious.

A. Khutoryansky et al. Is Not A Digital System And One Would Not Be Motivated To Combine It With The Digital System Disclosed In Tam

The Examiner alleges that “Khutoryansky does not detail the structure of his detector, and it would have been obvious to employ therefore any known detector such as the digital detector taught by Tam in order to provide real time display.”⁵⁵ As discussed above, Khutoryansky et al. discloses “a universal radiographic apparatus that allows an operator to select between *conventional* radiographic mode and linear tomographic mode.”⁵⁶ Khutoryansky et al. does not disclose any form of radiography or tomography besides the film based type, as discussed above. Clearly, Khutoryansky et al. does not teach, nor suggest, a digital detector, or digital radiography or tomography. Thus, the Applicant respectfully submits that Khutoryansky et al. cannot be combined with references that disclose digital x-ray systems.

The Manual of Patent Examining Procedure (MPEP), states the following:

⁵⁵ Paper 11, at page 3.

⁵⁶ Khutoryansky et al. at Abstract (emphasis added).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.⁵⁷

Further,

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure.⁵⁸

The MPEP also states the following:

The tendency to resort to "hindsight" based upon applicant's disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.⁵⁹

One would not be motivated to combine Khutoryansky et al. with Tam. Tam discloses "a system for acquiring data for use in constructing a CT image of an object having a region of special interest."⁶⁰ Further, Tam discloses an analog-to-digital converter 52, as shown in Figure 5, that converts data signals into digital form, and couples them to a processing unit 54."⁶¹

⁵⁷ MPEP at §2143.

⁵⁸ *Id.*

⁵⁹ MPEP at §2142

⁶⁰ Tam at Column 2, lines 14-16.

⁶¹ *Id.* at Column 6, lines 54-62.

As discussed above, Khutoryansky et al. does not teach, nor suggest, a digital detector and/or digital image acquisition. The film based system described in Khutoryansky et al. is different than the digital system described in Tam. No suggestion is made in Khutoryansky et al. to replace the table and/or wall bucky with a digital detector, or the digital system of Tam, for the purpose of providing a real time display, or for any other purpose. Thus, the Applicant respectfully maintains that no motivation exists to combine Khutoryansky and Tam in this manner.

The Applicant also notes that Tam makes only a passing reference to a display and does not teach, nor suggest, the step of “displaying images simultaneously as each image in said series of images is acquired,” as recited, for example, in claim 10 of the present application. Tam’s only reference to image display states the following: “Unit 54 places the data in condition for use by computer 48 to generate an image of the object 14, such as by means of display 56.”⁶² Thus, not only does the combination of Khutoryansky et al. and Tam not teach, nor suggest, various limitations recited in claim 10, one of ordinary skill in the art would not be motivated to combine these two references.

B. Sata Does Not Teach, Nor Suggest, Acquiring A Series of Images Corresponding To Slices Of Interest, Or Displaying Images Simultaneously

The Examiner maintains that “Sata teaches an x-ray tomograph equipped with a display 40 for simultaneously showing multiple tomographic views.”⁶³ Sata discloses a helical scanning system in which an x-ray detector and source rotate around a patient table, that is longitudinally translated.

⁶² *Id.* at Column 6, lines 60-63.

⁶³ Paper 11, at page 3.

Roughly speaking, while the x-ray tube employed in the X-ray scanner 2 is rotated around the patient 20, the patient 20 (couch) is translated along a longitudinal direction of the patient, so that the relative trail of the X-ray tube 10 with respect to the patient represents a helical shape (see FIG.3).⁶⁴

This system varies significantly from that disclosed in Khutoryansky et al. As shown in Figure 1 of Khutoryansky et al., the table 107 remains longitudinally fixed, while the x-ray tube 106 and the table bucky 108 may longitudinally translate relative to the table 107. However, the X-ray tube of Khutoryansky et al. does not rotate around the patient in a circular, semi-circular, or helical manner. For this reason alone, the systems described in Khutoryansky et al. and Sata operate in substantially different ways.

Further, Sata states, "It should be understood that according to the present invention, the patient 20 is helically scanned *only one time* by the X-ray scanner 2 of the first X-ray CT imaging system 100 so as to obtain *both* of scano data and CT image data."⁶⁵ After the scan, Sata teaches

processing said selected X-ray projection image data to produce a scanogram (22) of said helically-scanned biological body (20); and reconstructing an X-ray CT image (21) of said helically scanned biological body (20) based upon said entire X-ray projection image data, whereby both of said scanogram (22) and said X-ray CT image (21) are substantially simultaneously displayed.⁶⁶

⁶⁴ Sata at Column 5, lines 25-31.

⁶⁵ *Id.* at Column 5, lines 4-8 (emphasis added).

⁶⁶ *Id.* at Column 2, lines 32-39.

Therefore, as illustrated in FIG. 10 of Sata, the CT image 23, top viewed scanogram 26, and side-viewed scanogram 27 are all images derived from the one x-ray scan rather than images acquired in a series.

In order to display the images, Sata first processes image data to produce the scanogram. Then, the system of Sata reconstructs the X-ray CT image. Sata then “substantially simultaneously displays” the scanogram and the X-ray CT image. However, Sata does not teach, nor suggest, “displaying images simultaneously as each image in [a] series of images is acquired,” as recited in claim 10 of the present application.

Overall, Sata clearly teaches away from multiple scans (i.e., “acquiring a series of images,” as recited in claim 10). Further, Sata does *not* display images as they are acquired. Neither Khutoryansky et al., nor Sata (nor Tam), alone or in combination with one another, teach or suggest “displaying images simultaneously as each image in said series of images is acquired,” as recited in claim 10.

Additionally, it is respectfully submitted that there is no motivation to combine Khutoryansky et al. and Sata. In addition to the obvious differences in system operation between the two (i.e., Sata’s helical scan compared to Khutoryansky et al.’s linear scan), Khutoryansky et al. is silent with respect to displaying any images. No image monitor is illustrated in any figure of Khutoryansky et al., nor is a digital x-ray detector utilized. Instead, Khutoryansky et al. uses a film based table bucky and/or a wall bucky to acquire images.⁶⁷

⁶⁷ Khutoryansky et al. at Column 1, lines 26-28 and Column 3, lines 60-62.

C. Khutoryansky et al. Cannot Be Combined With Tam And/Or Sata

The law is well settled that “obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion or incentive to do so.”⁶⁸ It is not permissible to pick and choose among the individual elements of assorted prior art references to re-create the claimed invention, but rather “some teaching or suggestion in the references to support their use in the particular claimed combination” is needed.⁶⁹

The Applicant respectfully submits that a person having ordinary skill in the art would not be motivated to combine Khutoryansky et al. with Tam and Sata. As discussed above, Khutoryansky et al. discloses a film based system, while Tam and Sata are directed to digital systems, in addition to other differences.

In *Ex parte Hiyamazi*⁷⁰, the Board of Patent Appeals and Interferences reversed a rejection based on a combination of references, stating, in part:

Under 35 USC § 103, where the Examiner has relied upon the teachings of several references, the test is whether or not the references viewed individually and collectively would have suggested the claimed invention to the person possessing ordinary skill in the art. Note *In re Kaslow*, 707 F.2d 1366, 107 USPQ 1089 (Fed.Cir. 1983). It is to be noted, however, that citing references which merely indicate the isolated elements and/or features recited in the claims are known is not a sufficient basis for concluding

⁶⁸ *ACS Hospital Systems, Inc. v. Montfiore Hospital*, 732 F.2d 1572, 1577, 221 USPQ 929 (Fed. Cir. 1984).

⁶⁹ *Symbol Technologies, Inc. v. Opticon, Inc.* 935 F.2d 1569, 1576, 19 USPQ2d 1241 (Fed. Cir. 1991)

⁷⁰ 10 USPQ2d 1393 (Bd. Pat. App. & Interf. 1988)

that the combination of claimed references would have been obvious. That is to say, there should be something in the prior art or a convincing line of reasoning in the answer suggesting the desirability of combining the claimed invention. Note *In re Deminski*, 796 F.2d 436, 230 USPQ 313 (Fed.Cir. 1986).⁷¹

During the prosecution of the present application, the Examiner noted the following:

Khutoryansky does not detail the structure of his detector, and it would have been obvious to employ therefore any known detector such as the digital detector taught by Tam in order to provide real time display. Sata teaches an x-ray tomography equipped with a display 40 for simultaneously showing multiple tomographic views, and it would have been obvious to one of ordinary skill in the art at the time the invention was made to equip the Khutoryansky with such means to speed up medical diagnosis.⁷²

However, the MPEP states the following:

A statement that modification of the prior art to meet the claimed invention would have been “well within the ordinary skill of the art at the time the claimed invention was made” because the references relied upon teach all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993)...⁷³

⁷¹ 10 USPQ2d at 1394.

⁷² Paper 11 at page 3.

⁷³ MPEP at §2143.01.

The Applicant respectfully submits that the Examiner is merely picking and choosing particular elements among different prior art references to assert that claims of the present application are obvious. Instead of providing an “objective reason to combine the teachings of” Khutoryansky et al., Tam, and Sata, the Examiner summarily concludes that because Khutoryansky et al. does not “detail the structure of his detector,” it would have been “obvious to employ any known detector.”⁷⁴ Through this statement, the Examiner admits that Khutoryansky et al. does not explicitly teach a digital x-ray system. To overcome this glaring deficiency, the Examiner merely picks and chooses the digital detector of Tam and the display of Sata, without providing objective reasons why these isolated elements can be combined with Khutoryansky et al., other than to say that “it would have been obvious to do so.”⁷⁵ The Applicant also notes that even if these references could be combined, each and every limitation of the claims of the present application is not taught by the combination, as discussed above.

In combining Khutoryansky et al. with Tam and Sata, the Examiner has merely picked and chosen among isolated, individual elements of assorted prior art references to re-create the Applicant’s claimed invention. There is no teaching or suggestion in these references to support their use in the particular claimed combination. The proposed combination represents “the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.”⁷⁶ Hence, the Applicant respectfully submits (and maintains) that claims 6-7 and 10-21 are in condition for allowance.

⁷⁴ Paper 11 at page 3.

⁷⁵ *Id.*

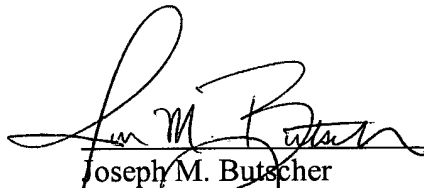
⁷⁶ *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983).

CONCLUSION

As discussed above, the Applicant respectfully submits that the pending claims are allowable in all respects. Therefore, the Board is respectfully requested to reverse the rejections of pending claims 1-2, 5-7, 9-21 and 23.

Respectfully submitted,

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